

## REGIONAL MOBILITY

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### **A INTRODUCTION**

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This chapter of the Regional Comprehensive Plan and Guide (RCPG) is a summary of the Southern California Association of Governments' 1994 Regional Mobility Element (RME)<sup>1</sup>

As it approaches the 21st Century, Southern California confronts a historic transportation crisis that has become a planning war against increasing mobility gridlock and air pollution complicated by a lagging economic recovery and a growing population.

The Regional Mobility Element is the principal transportation policy, strategy, and objective statement of the Southern California Association of Governments, proposing a comprehensive strategy for achieving mobility and air quality mandates. It describes the region's strategy for adjusting its transportation behavior and investments as it balances the constraints of government-mandated financial and environmental objectives and mobility demands. The

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<sup>1</sup> A copy of the complete 1994 Regional Mobility Element may be obtained by contacting SCAG.

RME is a plan that not only comes within fiscal limits but also meets the mandated mobility and air quality requirements through 2015.

Federal and state legislation has vested SCAG with the responsibility of preparing the regional transportation plan and program, which have been developed as part of the Regional Comprehensive Plan and Guide -- the blueprint for managing growth and resources in the region prepared by SCAG in conjunction with subregions, cities and counties, the public, state and federal governmental agencies, and private organizations. (See Table 4-1, RME Goals and Subgoals.)

The RME links the goal of sustaining mobility with the goals of fostering economic development, enhancing the environment, reducing energy consumption, promoting transportation-friendly development patterns, and encouraging fair and equitable access to residents affected by socio-economic, geographic, and commercial limitations. It proposes doing this with an innovative strategy that builds on and maximizes huge public investments in highways, rails, buses, airports, seaports, truck facilities, and communications technologies.

Cast against a backdrop of the California recession, the 1994 RME is different from past transportation plans in its greater concern for the economy, particularly jobs for a region that is expected to undergo a 50 percent population growth by 2015. SCAG projects that the region's population in 2015 will have grown to 22 million (See Table 4-2, Population, Employment, and Housing Growth).

The Final RME treats transportation as a powerful job creation engine that is critical to the future of the SCAG region's economy, which today is the 12th largest in the world -- between that of Spain and India. Industry clusters spawned by future transportation technology can serve as the driving forces for the regional economy of the next century.

The core of the RME is the planned improvements to highways, rail and bus transit, ports, truck facilities, and aviation facilities that County Transportation Commissions, the state, and other agencies have committed to fund over the next 20 years to better move people and goods.

To this core, an advanced transportation and air quality technologies strategy has been added to help meet the strict air emissions and mobility requirements the region must confront over the 20-year planning period. This development and implementation of Advanced Transportation Technology strategy includes the use of zero-emission vehicles, alternative fuels, telecommunications, Intelligent Vehicle Highway Systems (IVHS), and Advanced Shuttle transit. "Clean Cities," a voluntary federal program designed to accelerate and expand the use of alternative fuel vehicles, along with an overall marketing and communications program will augment the Advanced Technology strategy.

The RME also suggests the introduction of Market Incentives as a mechanism to reduce travel demand and pollution and to provide new transportation choices as well as funding for transportation alternatives that are highly efficient and performance-based. Through Market Incentives, gross polluters would pay a premium, and cleaner cars would pay less. Proceeds would be reinvested into performance- and equity-based improvements that directly improve personal mobility, goods movement, and air quality. Additionally, this Plan advocates additional corridor-pricing options to build new or added facilities where it is appropriate. It also recommends a new long-term financing base for transportation as gasoline consumption and taxes decline in the future. Ultimately, Market Incentives would be established by legislative process after an extensive regional review process to develop proposals and advice to law makers. Ultimately, the RME Plan proposes to meet mobility and air quality requirements while providing the region's ethnic and geographically diverse population with more choices of alternative transportation modes than those now available.

**TABLE 4-1  
RME GOALS AND SUBGOALS**

<b>SUSTAIN MOBILITY</b>				
<ul style="list-style-type: none"> <li>Sustain or better the 1990 levels of service for the movement of people and goods.</li> <li>Ensure that transportation investment provides for the greatest possible mobility benefit.</li> <li>Serve the transportation needs of everyone including the elderly, handicapped, disadvantaged and transit-dependent.</li> <li>Develop regional transportation solutions that complement subregional transportation systems and serve the needs of cities and communities.</li> </ul>				
<b>RME SUBGOALS</b>				
<b>Foster Economic Vitality</b>	<b>Enhance the Environment</b>	<b>Reduce Energy Consumption</b>	<b>Promote Transportation-Friendly Development</b>	<b>Promote Fair and Equitable Access</b>
<ul style="list-style-type: none"> <li>Promote transportation strategies that support and encourage economic vitality within the region, and assist in developing the Southern California economic base.</li> </ul>				l and bus transit and high occupan

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<ul style="list-style-type: none"><li>Promote transportation strategies that reduce public <u>and</u></li></ul>				

private costs, and enhance the region's competitive position.			land-use	movement for households and bu
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<ul style="list-style-type: none"><li>Support transportation activities that encourage production of goods and services for local consumption as well as for export to other regions.</li></ul>			telecomm	ew communications technology for



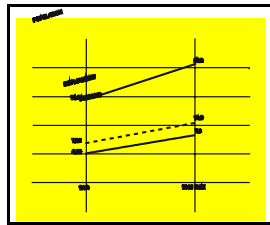
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<ul style="list-style-type: none"><li>• Ensure that the region receives the maximum amount of federal, state, and private transportation funding and the employment these funds bring with them.</li></ul>			<p>3rd tier tr to rail tra</p>	<p>that ensure fair and mutually suppo</p>

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**TABLE 4-2**  
**POPULATION, EMPLOYMENT, &**  
**HOUSING GROWTH (Millions)**



SOURCE: Modeling SCAG

## **B. SETTING**

The SCAG region's population is a commuter society that relies on Single Occupancy Vehicles (SOV) for a majority of all trips. For home to work commutes, Average Vehicle Ridership (AVR) is 1.38 persons per car.

Only 5.62 percent of the population use some form of transit to commute to work. On the average, each person makes 3.40 daily trips in their automobile, and each person drives an average of 20.48 miles per day. Their average speed during the morning peak period is 29.6 miles per hour.

Currently, in the urbanized counties and in many of the transit corridors that link urbanized counties to other parts of the region, commuters must struggle with congested freeway trips that are primarily Level of Service (LOS) E and F during peak drive periods. (See Figure 4-1, 1990 E and F Levels of Service<sup>2</sup>.) Daily congestion results in 2,152,000 hours of delay added to travel times.

<sup>2</sup>Level of Service (LOS) is measured on a scale of A through F. An A rating is best. Level F is stop and go congestion.

Figure 2-1: (Map: 1990 Levels of Service)

Unfortunately, Southern California must deal with some of the nation's dirtiest air problems. As detailed in Table 4-3 - SCAG Air Basin Attainment Status. Ozone, Carbon Monoxide, Nitrogen Dioxide, and Particulate Matter exceed federal standards in one or more of the air districts in the SCAG region.

In recent years, great strides have been made in reducing auto emissions in Southern California. Nevertheless, though extremely costly, the region remains committed to even greater reductions in the future.

**TABLE 4-3  
SCAG AIR BASIN ATTAINMENT STATUS**

AREA	POLLUTANT (ATTAINMENT YEAR)			
	Ozone	CO	NO <sup>2</sup>	PM <sup>10</sup>
SCAB	Extreme (2020)	Serious (2000)	Non-attainment (1984)	Non-attainment
VCAPCD (SCCAB)	Severe (2005)	Attainment	Attainment	Attainment
MDAQMD (SEDAB)	Severe (2007)	Attainment	Attainment	Moderate
Coachella Valley (SEDAB)	Severe (2007)	Unclassified	Attainment	Moderate
ICAPCD (SEDAB)	Transitional	Unclassified	Attainment	Non-attainment
N.L.A. Desert (SEDAB)	Severe (2007)	Unclassified	Attainment	Attainment

## **C OBJECTIVES**

As a broad vision for the region's future, the RME Plan has as its objective meeting federally mandated transportation and air quality standards by making aggressive use of existing facilities and conventional funding as well as of Advanced Transportation Technologies and new Market Incentives. These approaches are part of an overall strategy integrating air quality, mobility, and economic goals outlined in SCAG's Regional Comprehensive Plan and Guide.

The underlying philosophy of this vision is one of creating a supportive environment while maximizing choices for consumers through encouraging innovation and alternatives. The Plan proposes to reduce emissions and improve mobility more cost-effectively than traditional regulatory methods, through Market Incentives and investments in Advanced Transportation Technologies and other improvements that meet performance, efficiency, and equity tests.

Federal mobility mandates include: 1) contributing to an increase in peak-period Average Vehicle Ridership; 2) offsetting the growth of emissions due to an increase in vehicle trips and Vehicle Miles Traveled (VMT); and 3) meeting emission budget requirements for mobile sources as determined by final state and/or federal implementation plans. (See Table 4-4, Federal Requirements for Mobility and Air Quality.) Additionally, in meeting a mandated requirement under ISTEA, the RME calls upon SCAG to work with counties, subregions, Caltrans and federal highway and transportation agencies to further define SCAG's role in the Major Investment Analysis process.

The Major Investment Analysis of largescale transportation projects will narrow the range of alternative investment strategies and assist the investing agency in utilizing resources for the best mobility investment.

**TABLE 4-4  
FEDERAL REQUIREMENTS  
FOR MOBILITY AND AIR QUALITY**

Federal Requirements
<ul style="list-style-type: none"><li>• Contribute to an increase in peak-period Average Vehicle Ridership (AVR) by large employers with 100 or more employees. - 42 U.S.C. §7511a(d)(1)(B)</li><li>• Offset with Transportation Control Measures (TCMs) the growth of emissions due to an increase in vehicle trips and Vehicle Miles Traveled (VMT). - U.S.C. §7511a(d)(1)</li><li>• Meet emission budget requirements for mobile sources and determined by final State Implementation Plan/Federal Implementation Plan.</li></ul>

State requirements include: 1) achieving an average vehicle occupancy of 1.5 persons per vehicle during commuter peak period hours by 1999 in severe and extreme non-attainment areas and 2) achieving a substantial decrease in the growth of passenger vehicle trips and VMT in serious, severe, and extreme non-attainment areas. (See Table 4-5, State Requirements for Mobility and Air Quality.)



**TABLE 4-5  
STATE REQUIREMENTS  
FOR MOBILITY AND AIR QUALITY**

State Requirements
<ul style="list-style-type: none"> <li>• Achieve an average vehicle occupancy of 1.5 persons per vehicle during commuter peak period hours by 1999 in severe and extreme non-attainment areas. - Calif. Health and Safety Code 40920(a)(2)</li> <li>• Achieve a substantial decrease in the growth of passenger vehicle trips and VMT in serious, severe, and extreme non-attainment areas. - Calif. Health and Safety Code 40919(a)(3)</li> <li>• California Air Resources Board recommends that air districts "...design plans that reduce VMT and trips growth rates to the maximum degree feasible, and which, at a minimum, decrease growth of VMT and trips to the rate of population or household growth."<sup>3</sup></li> <li>• Allow no net increase in mobile source emissions after 1997 in severe and extreme non-attainment areas. - Calif. Health and Safety Code 40920(a)(2)</li> <li>• Meet emission budget requirements for mobile sources as determined by final State Implementation Plan/Federal Implementation Plan.</li> </ul>

In addition to objectives defined by state and federal law, as a SCAG policy, the RME proposes to increase the mode split in transit ridership between 10 to 14 percent over the current 5.6 percent for home to work trips by 2015.

Additionally, as a SCAG policy, the RME Plan calls for a Zero Emission Vehicle (ZEV) sales goal to capture 60 percent of the market for new vehicle sales by the year 2015, up from 50 percent in 2010.

The Plan promotes choice for the regulated communities and seeks to provide alternatives to command and control regulation through the Market Incentives and Advanced Transportation Technologies. For example, the application of Advanced Transportation Technologies to special opportunity areas such as multi-use activity centers, transit-oriented centers, intensive business centers and airports as well as their environs could provide an effective substitute to the employer rideshare requirements such as Regulation XV.

## **D. JOBS**

As an economic by-product, the RME Plan foresees its strategy being a catalyst for the Southern California job market.

Assuming moderate levels of market penetration made feasible by educational and infrastructure deployment programs, the job creation potential is 73,000 jobs from zero-emission or electric vehicles and 277,000 in additional Advanced Transportation Technologies by the year 2010. Total jobs created by Advanced

<sup>3</sup>CARB California Air Act Transportation Guidance, Transportation Standards, May 1991, Page 3.

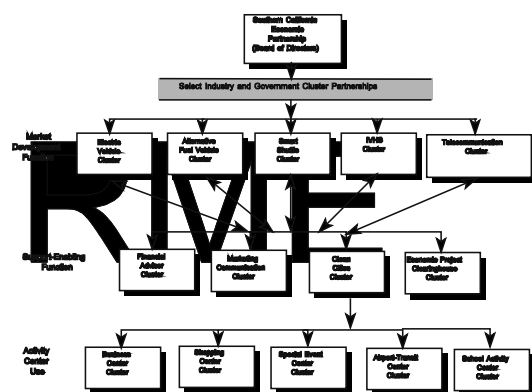
Transportation Technology could rise to over 350,000 by 2010. Another 1.38 million jobs by 2010 would occur through the development and operation of additions to the highway and transit systems by 2010. This number is expected to increase to 2.4 million by 2015. (See Table 4-6, Estimated Annual Net Economic Impact from RME Highway & Transit Projects). The cumulative total of all jobs created by the RME Plan is approximately 1.73 million by 2010.

**TABLE 4-6  
ESTIMATED ANNUAL NET ECONOMIC IMPACT FROM RME  
HIGHWAY & TRANSIT PROJECTS**

The 94 RME proposes a Southern California Economic Partnership (SCEP), which is a public-private sector collaborative effort that will bring government and industry together to determine how best to successfully deploy new technologies into the Southern California market place.

The mission of the SCEP is to: establish industry and government clusters for each transportation technology; identify market barriers and incentives to increase the demand for these technologies; and monitor the technology deployment effectiveness and recommend alternative strategies. Product development is anticipated to occur in the following industry clusters: zero emission vehicles; alternative fuel vehicles; Advanced Transit Shuttles; Intelligent Vehicle Highway Systems (IVHS); telecommute-teleservices marketing and communications; and the Clean Cities. These industry clusters offer the maximum potential for cost-cutting and job creation. (See Table 4-7, SCEP Project)

**TABLE 4-7**  
**SCEP ORGANIZATION**



Additionally, improved mobility can have a direct impact on jobs related to goods movement, which in the SCAG region critically links the local economy to state, national and world trade and can significantly affect the

environment, quality of life, and land use as well as transportation. The U.S. Department of Commerce calculates that for every additional \$1 billion of U.S. exports, 19,000 jobs are created through the increased demand for manufactured goods, their delivery and related business.

## **E. STRATEGY**

### **1. Facilities**

The RME strategy is built on the 20-year local plans for each county. These plans include existing levels of bus service plus identified rail projects, as well as transit, aviation, truck, and ports capital projects for which funding can be expected through 2015.

The Plan is critically connected to the region's road and highway system, whose arteries represent the lifeblood of transportation in Southern California. The projected costs for highway and transit programs and projects in the RME total about \$56.2 billion, which does not include Advanced Technology costs.

By 2015, improvements are projected to include an additional 1,446 freeway miles and 1,264 miles of additional High Occupancy Vehicle (HOV) lanes. The RME builds on this existing system with strategies ranging from three-tiered transit services to the use of HOV lanes and Mixed Flow Congestion-Relief system improvements. (See Figure 4-2, Existing and Proposed HOV Lanes, and Figure 4-3,

Proposed Mixed Flow Projects.)

The Plan proposes a three tier approach to transit. Tier 1, of this three-tier transit approach involves the longer distance line haul service such as Metrolink, longer distance rail services, and some express bus service. Tier 2 is the support bus and paratransit service that provides service connecting to Tier 1 service as well as medium distance subregional-oriented service in and around communities. Tier 3 is localized, short trip service such as taxis and shuttles that is more community oriented.

Regional public transportation improvements are currently directed toward the implementation of the rail programs designed to create the infrastructure which supports service on high-and-medium-capacity corridors. The proposed improvements include nine urban rail lines, nine commuter rail lines, and two inter-city corridor lines. (See Figure 4-4, Existing and Proposed Urban and Inner City Rail Lines and Figure 4-5, Existing and Proposed Commuter Rail Lines.)

Key to improving the movement of goods in the region, especially in the wake of the North American Free Trade Agreement (NAFTA), is completion of the new Port of Entry in Imperial County, the Alameda Corridor, extension of highway access to Port Hueneme, and overall improvements to intermodal freight movement projects.

Figure 4-2 (Map: Existing and Proposed HOV Lanes)

Figure 4-3 (Map: Proposed Mixed Flow Project)

Figure 4-4 (Map: Existing and Proposed Urban and Inner City Rail Lines)

Figure 4-5 (Map: Existing and Proposed Commuter Rail Lines)



## **2. Transportation Demand Management**

The RME Plan utilizes Transportation Demand Management (TDM) strategies, which attempt to modify people's travel behavior, especially for the future when the impact of population growth on transportation facilities will be significant.

In 2015, congestion on the streets and highways will be greater, traffic movement will be slower, the duration of traffic delay will more than triple. People will be making fewer automobile trips, but the total number of automobile trips being made by the increased number of motorists will be 43 percent more than the trips made in 1990.

Historically, major TDM emphasis has been on reducing the SOV home-to-work commute. In the short term, the region's TDM efforts will continue to focus on the promotion and support of ridesharing, ridematching, telecommuting, teleconferencing, the use of bus and rail transit, job site flex time, alternative work weeks, non-motorized travel, carpool subsidies, indirect Market Incentives, and land-use strategies.

Over the long term, however, a more market-oriented, user-based approach to demand management is proposed. Market Incentives have the potential to not only reduce demand but also reduce air quality emissions, while helping provide transportation alternatives and long-term transportation financing.

These TDM strategies complement the region's facilities investment in HOV, transit and Advanced Technologies.

## **3. Transportation System Management**

The RME covers Transportation System Management projects that include traffic signal synchronization and operation components improvements such as closed circuit television, ramp meter installations, traffic operations centers, and the Smart Streets operation in certain cities and counties in the region.

In addition, the Plan encourages expanding Transportation System management by local jurisdictions as well as coordinating TSM activities in the region and incorporating advanced system technologies where appropriate.

## **4. Urban Form**

The RME has integrated urban form as a mobility strategy, taking into consideration the relationship between land use and travel behavior.

The Plan, based on subregional recommendations, promotes land-use development patterns, including job-housing balance, to enhance the efficiency of the region's transportation system. A few subregions already have explicit policies that encourage job-housing balance, balanced communities, and transit-oriented development.

On March 3, 1994, as a result of deliberations of the Community, Economic and Human Development

Committee and the Standing Committee on Planning, SCAG staff was directed to re-examine the issue of jobs-housing balance and balanced growth in general. A study is presently underway and will be incorporated by amendment, as needed.

## **5. Advanced Technology**

Advanced Transportation Technologies are intended to provide consumers with products and services that preserve the same quality of life and convenience of mobility they experience today. These measures are expected to achieve the greatest emission reductions through an aggressive program implemented to achieve moderate to high levels of market penetration.

Overall, Advanced Technologies are expected to contribute significantly to reduced emissions in the region. Without support from Advanced Technologies and other highly efficient efforts, the current local plans involving traditional transportation improvements cannot meet air quality and mobility mandates.

The Advanced Technologies employed in the Plan includes the use of zero-emission vehicles, alternative fuels, telecommunications, IVHS, and Advanced Shuttle Transit. (The order in which technologies are listed implies no particular implementation priority.)

### ***a. Zero Emission Vehicles***

The technology for zero-emission vehicles is intended to reduce emissions by accelerating the introduction of these vehicles beyond requirements of government mandates. This would be facilitated through a cooperative public-private partnership project acting as a support program.

By 2010, the annual new vehicle market penetration for zero-emission vehicles is expected to reach 60 percent, involving in excess of 500,000 vehicles. At the same time, an estimate of the job creation from the start of a new zero-emission vehicles industry is estimated to be about 73,000 jobs over the same period.

Accelerating the introduction of zero-emission vehicles will reduce the permissible fleet average emissions for light heavy duty vehicles beyond currently required reductions.

Implementation of this aspect of the plan would be accomplished through creation of the Zero-Emission Vehicle Industry Cluster whose role would include developing a market plan for zero emission vehicles. As part of the SCEP Project, this public-private cluster would promote fleet conversion and acquisition of refueling infrastructure. In addition, regional and local regulatory actions would be aimed at facilitation of introduction of zero emission vehicles.

### ***b. Alternative Fuels***

Alternative fuel technology aims to increase the rate of emission reductions by accelerating the introduction of low- emission, alternatively fueled vehicles through cooperative public-private partnerships and the use of Market Incentives.

An Alternative Fuels Industry Cluster would take the leadership in helping refine and develop a "local" regulatory framework to establish a market environment for alternative fuels as well as supporting market incentives that would enhance the competitiveness of alternative fuel vehicles.

In addition, regional and local regulatory actions would be aimed at facilitating the introduction of low emission alternatively fueled vehicles.

By 2015, annual new vehicle market penetration for alternative fuel vehicles is expected to include 250,000 vehicles for an estimated market share of 14 to 34 percent. Meanwhile, the economic impact of alternative fuels would also include the creation of about 9,000 new jobs by the same period.

Implementation of the alternative fuels strategy would be accomplished through the Alternative Fuels Industry Cluster, whose responsibilities would include accelerating market penetration. This cluster would also be responsible for adopting appropriate monitoring mechanisms.

***c. Telecommunications***

The telecommunications technologies involve a number of technologies, including: teleconferencing, teleservices, tele-education, telemedicine, teleshopping, telebanking, telecommuting, and other applications.

Telecommuting as a substitute for home-to-work vehicle trips would be accelerated through cooperative public-private industry clusters. Telecommuting is using electronics to move information and/or pictures that allow work to be done from home or from a neighborhood work center.

In 1990, telecommuting impact amounted to a reduction of 4.1 percent in home to work trips. This reduction is expected to increase to 6.3 percent by the year 2015. Total penetration of the market is anticipated to be between 5 to 14 percent of all work trips.

Currently, basic telecommunications technologies or devices are commercially available. The barriers to use are embracing the concept of telecommuting and other teleservices and the cost of the equipment at home for the telecommuter.

In terms of jobs, an estimate of the potential job creation from the sale of all telecommunications technologies is about 42,000 jobs in 2000 and 65,000 jobs in 2010 for the State of California.

To implement the telecommunications aspect of the strategy, the RME proposes establishing a Telecommunications Deployment Industry Cluster as part of the SCEP Project that will be responsible for identifying and acting on market barriers and applications. The SCEP Project will assemble the interested industry and government parties to identify and eliminate use and regulation barriers, establish a seed fund for telecommunications equipment purchases, and develop an education program for employers.

***d. Intelligent Vehicle Highway System (IVHS)***

The Intelligent Vehicle Highway System (IVHS) technologies represent a variety of technologies that basically transfer information to the vehicle or driver to improve the safer and more efficient use of the

highway system. IVHS technologies or products have two major deployment applications: highway-road systems and on-vehicle.

These technologies are intended to reduce mobile source emissions from light and heavy duty vehicles through improved operational performance of the transportation system. By the year 2015, the market penetration of IVHS technology is expected to exceed 250,000 vehicle information device units.

IVHS technologies include: Advanced Traffic Management System (ATMS) technologies like computerized signal and control systems that synchronize lights to reduce unnecessary stops, thus improving the vehicle emissions drive cycle; Advanced Traveler Information System (ATIS) technologies that warn drivers in advance of severe congestion; Advanced Vehicle Control System (AVCS) technologies such as collision-avoidance systems that reduce accident related congestion; Commercial Vehicle Operation (CVO) systems that control the routing of commercial fleet vehicles to avoid excess travel and congestion; and Passenger Transportation (APTS) technologies that can dispatch Advanced Shuttles more efficiently or give the time and location of the next bus or train to the transit passenger.

IVHS technologies would be deployed by establishing a private/public cluster to develop a market plan for the consumer. This industry cluster is part of a larger technology deployment project, SCEP, which will act as a support program for this cluster. Implementation would also be accomplished through development of industry standards for on-vehicle systems and enhanced requirements for vehicle control and safety systems. Furthermore, implementation would be assisted at the consumer level through the use of Market Incentives such as reduced insurance rates for the purchase of AVCS items like collision avoidance.

IVHS technologies would provide the following boost to the California economy: 61,000 new jobs by 2000 and over 140,000 new jobs by 2010.

***e. Smart Shuttle Transit***

Smart Shuttles build upon existing demand responsive transit modes, using advanced transportation technologies to provide service more tailored to the needs of individual riders. The goal for Smart Shuttles is to develop, implement, and integrate a public-private transportation service that offers an attractive alternative to the gasoline-powered automobile.

By 2015, Smart Shuttles and conventional transit with TDM programs are expected to account for 10 to 14 percent of all work trips and involve 50,000 Smart Shuttle vehicles in the region.

Smart Shuttles would be most effective and efficient in three different types of applications: corridor service, center-focused service, and community-based service. In corridors, Smart Shuttles would provide service similar to jitneys like those operating in Atlantic City without fixed stops or a fixed route within a defined corridor. Center-focused services such as airport shuttles would provide enhanced access to employment centers, rail stations, and other large traffic generators. Community-based services would include transportation to shopping, recreation, and health facilities.

Emissions would be reduced by deployment of Smart Shuttles through the use of Advanced Transportation Technologies such as computer-aided dispatching as well as the use of alternative fuels.

Implementation of Smart Shuttles would be accomplished through the creation of a public-private partnership with the mandate to create a market environment which promotes development and use of alternative public transportation services along with integration of new technologies and removal of regulatory barriers. The Smart Shuttle Industry Cluster, which is part of the SCEP Project, will be such a public-private partnership and would foster and guide Smart Shuttle transit in the region.

In terms of jobs, an estimate of the job creation from the start of an Smart Shuttle industry is expected to be up to 65,000 new jobs by 2010.

These Advanced Technologies will be supported by the Clean Cities program, which as a SCEP component is charged with facilitating the procurement of "clean vehicles" and related infrastructure as well as other Advanced Technologies, including Smart Shuttles, telecommunications, and IVHS products. The Clean Cities program will be especially involved in helping adopt EV charging facilities building code and permit requirements and other actions designed to encourage the use of electric automobiles.

## **6. Transportation Control Measures**

Additionally, the Plan includes the use of Transportation Control Measures (TCMs), strategies designed to reduce the amount of motor-vehicle based emissions by changing the way people make trips, by alleviating traffic congestion, and by facilitating infrastructure changes to promote alternatives to single-occupant vehicles.

Plans and requirements for TCMs used to meet air quality requirements differ for each of the region's six non-attainment areas reflecting the flexibility of the strategies. However, maximum use of reasonably available TCMs in conjunction with all other strategies (stationary and area) is mandated by state and federal law.

In addition to the use of TCMs related to vehicular use, the region's has also included strategies to reduce emissions from planes and trains.

The Railroad Emissions Control Measure from the 1989/91 South Coast Air Plan is being refined for the 1994 Ozone SIP Submittal. This measure focuses on railroad operations in the South Coast Air Basin, including freight, commuter, and intercity passenger trains. The intent is to reduce oxides of nitrogen from diesel-electric locomotives.

Additionally, the respective roles and responsibilities of the various agencies involved in implementing aviation TCMs are still being debated.

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## **F. FINANCE**

The budget for the 20-year life of the RME, including both traditional and innovative financing, is \$71 billion. All of the costs of the Plan will continue to be evaluated and refined in the future. This refinement

will occur in tandem with the refinement of the Market Incentives Program.

## **1. Traditional Funding**

The RME estimates that over the 20-year planning period, \$56 billion in cost for traditional highway and transit programs and improvement projects can be funded with reasonably available revenues of \$56 billion.

While regional expenses and revenues generally balance over the 20-year life of the plan, historical spending trends, air quality/congestion mitigation, costs of maintaining older infrastructure, declining gasoline tax revenues, and mounting transit operation expenses all threaten the region's precariously balanced budget.

It should also be noted that the end of the planning period may have too little facility investment given the expected population growth. Chapter 9, Long-Range Corridors, describes many possible candidates that future plan refinements must address and as appropriate provide funding.

## **2. Innovative Funding**

Consequently, it is clear that the region's traditional funding sources for the foreseeable future are insufficient to pay for Advanced Technologies and other corridor improvements which are needed to meet air and mobility mandates. Thus, the plan calls for addition funding. One example of this added revenue could be provided through innovative funding through a series of user based fees to provide sufficient revenues in order for the Plan to be considered fiscally constrained as required by the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA).

It is expected that approximately \$15<sup>4</sup>-29 billion will be needed to finance the range of various Advanced Technology improvements and performance-based projects which are crucial to the Plan's strategy through 2015.

The funding mechanism would probably provide that low polluting vehicles contribute a lesser amount than grossly polluting vehicles. After a multi-year gradual phase in, a VMT/Emissions Registration Fee could be expected to produce up to \$2 billion annually. The process for determining precise fee, differences in rates, and total amounts collected are briefly outlined in the Market Incentives section and the Implementation section of this chapter. It should be noted that any Market Incentives would be established by legislative process or by a ballot initiative after a regional process to develop proposals and advice to lawmakers.

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<sup>4</sup> \$15 billion is used in calculating the total 20-year costs.

## **F. MARKET INCENTIVES**

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### **1. Reasons to Introduce Market Incentives**

The use of market incentives seeks to balance supply and demand by equitably charging travelers for the full and true costs of driving an automobile, allowing consumers to make more informed travel decisions. Figure 4-6, Life-Cycle Gasoline Vehicle Costs (1990), illustrates the often overlooked expenses of owning and driving a car.

**FIGURE 4-6  
LIFE-CYCLE GASOLINE VEHICLE COSTS (1990)**

SOURCE: Market Incentives Task Force Report, February, 1994<sup>5</sup>

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<sup>5</sup>Modified for this analysis from Kevin Nesbitt, Daniel Sperling, and Mark DeLuchi, "Initial Assessment of Roadway-Powered Electric Vehicles", Transportation Research Record, No. 1267, 1990.

The RME proposes using Market Incentives to encourage travelers to seek alternatives while providing a revenue stream to fund those transportation alternatives that are highly efficient, performance-based, and maximize regional efforts to meet mobility and air quality goals.

Ultimately, establishing user-based financing of transportation improvements as well as providing a stable base of transportation funding, rather than general fund financing, are key strategic goals of Market Incentives.

## **2. Principles**

Market Incentives in the RME are designed to allow for equity so that an undue or disproportionate impact is not placed on low income groups, other user groups, commercial users or geographic areas. To the extent that such situations are identified, Market Incentive programs should mitigate such impacts through appropriate subsidy and reinvestment programs. Impacts on business should be mitigated to the extent practical and to allow increased opportunities for subregional and regional economic competitiveness.

Implementation and development of Market Incentives include having a nexus between Market Incentive fees and expenditures. Travel consumers must see direct and timely benefit from payment of market investment travel charges.

Another aspect of implementation involves efficient and performance-based requirements. The RME requires that all projects and improvements funded with Market Incentive fees must be highly efficient and performance based.

## **3. Market Incentive Methods**

At a meeting April 14, 1994, SCAG's Transportation and Communications Committee agreed that "new user-based fees shall be considered by the committee (including the transportation community) charged with developing an implementation strategy that could be used to substitute for gasoline taxes in the long term."

The RME proposes to consider the long-term replacement of traditional transportation funding sources (i.e. gasoline tax) with a different use fee such as one based on a VMT/emission registration charge. Such a replacement fee would probably be revenue neutral. But additional revenues could also be raised from higher VMT fees charged to gross polluters.

In addition, there could be congestion pricing in which specific transportation facilities would be priced or tolled based on the amount of congestion on that facility or corridor.

Another Market Incentive would be a Parking Cash-Out feature through provisions of state law being reaffirmed. Employers with 50 or more employees in non-attainment areas who subsidize employee parking, lease parking spaces, and can reduce the number of parking spaces without penalty are required to allow employees to choose between the parking space or a cash allowance.

In the proposed Air Quality Management Plan, there is an option for a possible pay-at-the-pump "backstop" which could be implemented, if needed, to help reduce emissions.



In moving toward implementation of user fees, the next step of the Plan calls for a public involvement program, exploring attitudes within the region and seeking a consensus on the Market Incentives.

This would also involve research through surveys and community outreach efforts designed to develop methods that would ameliorate impacts of Market Incentive measures, especially on groups handicapped by economic, geographic and commercial limitations.

Additionally, such a strategy of public involvement may take advantage of multi-media outreach -- newsletters, videos, public service announcements -- aimed at identifying issues as well as developing public participation and facilitating the implementation of the RME.

At the legislative level, the next steps would include a legislative process including review and comment of legislation dealing with the issue as well as possible new legislation to provide for the implementation of Market Incentives.

Ultimately, the perceptions of elected officials and the public will determine if the Market Incentives program is viable. If the Market Incentives are to be successfully implemented, public understanding and political acceptability are essential.

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## **G. PLAN PERFORMANCE**

The RME anticipates that its strategies will successfully maintain the regional transportation system, moving goods and people efficiently and ensuring the economic vitality of the region while also improving air quality through reduced emissions. Plan performance is formally detailed in the SCAG Executive Summary, 1994 RME Conformity Report which is included in Appendix B. Briefly, the RME Conformity Report finds: reasonably available funding; compliance by air basins with the Federal Clean Air Act and Transportation Conformity Regulations; timely implementation of TCMs, and compliance with ISTEA and other relevant regulations.

Over the next 20 years, the \$56 billion in traditional capital investments recommended in the RME and the resulting congestion relief benefits will create between 58,000 and 132,000 additional jobs per year from 1995 through 2015 with wage and salary incomes estimated between \$1.2 billion and \$2.6 billion each year. The \$15-29 billion investments in Advanced Technology and performance based projects would create an additional 350,000 jobs over the same period.

The number of single occupancy vehicles on the road will significantly decrease, from 72.5 percent in 1990 to 56.9 percent in 2015. (See Figure 4-7.) At the same time, other changes in the shift from single occupancy vehicles will include: an increase from 5.4 percent to 13.3 percent in transit, an increase from 18 percent to 18.5 percent in rideshare, an increase from 2 percent to 6.3 percent in telecommuting, and an increase from 2.5 percent to 3.5 percent in non-motorized transportation. (See Figure 4-8.)

But even with facility and technology improvements, SCAG modelling shows that the average daily speed for all trips will decrease from 32.5 miles per hour in 1990 to 27.2 miles per hour in 2015. (See Figure 4-9.) Meanwhile, the delay for drivers on the road will worsen by 106% in morning peak trips and by 196% in daily trips.

**FIGURE 4-7  
TRANSIT MODE SPLIT (HBW)**

**TRIPS**

**FIGURE 4-8  
PEAK HOUR HOME-TO-WORK**

**FIGURE 4-9  
AVERAGE DAILY SPEED (all trips)**

trip

from the

this

the two

(For modeling purposes, 1990

reductions for non-motorized and  
telecommuting were removed

total 1990 trip count. Therefore,

modeling chart reflects 0% for

modes. Actual 1990 trip

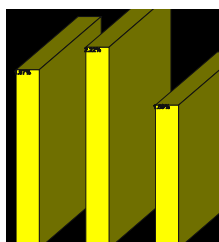
reductions

2.0%

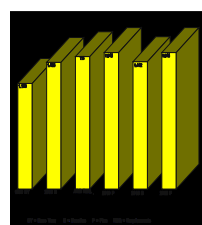
are 2.5% for non-motorized and  
for telecommuting.)

During this period, as population grows at just less than 2 percent per year, daily vehicle trips will increase at less than 1.6 percent. At the same time, vehicle miles traveled will grow just over 2 percent each year. (See Figure 4-10 and 4-10A.)

**FIGURE 4-10  
ANNUAL GROWTH RATES  
(Between 1990 and 2015)**



**FIGURE 4-10A  
AVERAGE VEHICLE RIDERSHIP (AVR)  
(Home-Base-Work Trips)**



SCAG modelling results also indicate that the RME strategies will dramatically improve Air Quality Performance Indicators.

Regionwide, pollutants decrease during the planning period. Reactive organic gases, carbon monoxide, and nitrogen oxides decrease significantly from 1990 to 2015 in each of the air basins. These emission results are based on 50 percent zero-emission vehicle sales in 2010 and 60 percent ZEV sales in 2015. (See Figure 4-11.)

## H. IMPLEMENTATION

Crucial to the implementation of the RME Plan strategies, especially the Advanced Technology strategies, is development of the Southern California Economic Partnership (SCEP) which will establish industry and government clusters for each transportation technology and facilitate their involvement in the region's transportation system and economic mainstream.

Market Incentive implementation, including, refinement, pricing levels, and a legislative agenda, will be undertaken by a committee charged with these responsibilities and appointed by the SCAG Regional Council. The Committee will also be charged with the task of reviewing and making recommendations on these issues related to innovative funding.

The RME calls for specific action steps, but it also should be viewed as a direction-setting document. The strategy behind the RME Plan is dynamic in that it will change over time to respond to evolving conditions in the marketplace, technological advances, political and legislative action, and mobility needs.

Industry and government institutions will be involved in the further analysis of Advanced Technologies and Market Incentives. Market Incentive development, refinement of new user based fees, and Advanced Technology implementation strategy, as well as pricing levels, and a legislative agenda will be studied by a committee appointed by the Regional Council. When recommending strategies to be funded, this committee will consider issues of equity, nexus of benefit to those shouldering the costs, and project efficiency/performance. As noted previously, this committee's findings and recommendations would constitute the first step in a regional process to develop proposals and advice that would be acted on and approved through the legislative process.

A complete summary, in table form, of additional action recommendations proposed by the RME can be found in Chapter 14, Regional Action Program Summary, of Volume 2.

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## **I. AMENDMENTS PROCESS SUMMARY**

SCAG intends to prepare at least one major amendment, including a conformity statement, every two years between plan adoption dates, if such an amended plan is deemed necessary. Plan amendments that do not require preparation of a conformity statement may be prepared more frequently. The RME will be certified periodically as required by state and federal law. See also Appendix A, Plan Amendment Process.

**FIGURE 4-11**  
**EMISSION REDUCTIONS: LIGHT & MEDIUM DUTY VEHICLES**

